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(19) (CA) **CANADIAN PATENT** (12)

(54) COMPOSITE HOCKEY STICK

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(73) Granted to Canadian Hockey Sticks Manufacturing Inc.
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ABSTRACT OF THE DISCLOSURE

A hockey stick which is made of composite construction to use lower grade and lighter woods and which is characterized by not only preserving the usual advantages of the conventional hardwood stick but by also gaining in ease of construction in more balanced strength, in breaking resistance, and in the damping characteristics. A hockey stick structurally characterized by comprising, in combination, a handle including a core of lower grade hardwood reinforced exclusively, on the opposite lateral sides respectively, by a pair of reinforcing layers each having stress resistant fibers extending lengthwise of the handle.

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THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED, ARE DEFINED AS FOLLOWS:

1. A composite hockey stick comprising a blade portion and an elongated handle portion including a core and a pair of reinforcing flat layers, said core extending lengthwise of said handle portion, being made of a wood material selected from lower grade hardwoods, and defining a first pair of opposite lateral flat sides, and a second pair of opposite lateral narrower flat sides, said handle portion thus having a rectangular cross-section, said pair of reinforcing flat layers being secured only against the first pair of opposite lateral flat sides of said core, said reinforcing layers being formed of strips of plastics having stress resisting, continuous, straight filaments embedded exclusively longitudinally therein, said filaments being laid side by side and independently of one another within said strips of plastics, said reinforcing layers extending lengthwise of said handle portion, so that said filaments extend solely lengthwise of said handle portion, said filaments being adhered in prestressed condition against said first pair of opposite lateral flat sides.
2. A composite hockey stick as defined in claim 1, wherein said core is made of "ramin" wood.



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This invention relates to hockey sticks.

The hockey sticks which are now manufactured and used include a handle portion which is made of solid wood selected from the best grade hard woods to obtain a product of desirable properties and resistance to breakage. The cost of a good hockey stick is therefore relatively high due to the inherent cost of a satisfactory hard wood and, furthermore, the hockey sticks have to be made oversize to have a desirable resistance.

The applicant proposes a hockey stick including a handle portion of composite construction, which has the desired properties including 10 resistance to breakage and stiffness without necessarily using one of the best grade hard woods nor increasing the cross-sectional area of the handle portion.

It is therefore a general object of the invention to provide a hockey stick of satisfactory properties without using one of the best grade hard woods.

It is a more specific object of the invention to provide a hockey stick having a handle portion of composite construction including reinforcement layers or strips adhered against the opposite lateral sides thereof to increase the stiffness and the resistance to breakage.

20 It is another object of the invention to provide a hockey stick including a composite handle portion formed of a core of wood material and reinforcing filaments adhered against the opposite lateral sides of the core to impart stiffness and resistance to breakage to a wood of otherwise non-acceptable stiffness.

The above and other objects and advantages of the invention will be better understood in the light of the following detailed description of preferred embodiments which are illustrated, by way of example only, in the accompanying drawings, wherein:

Figure 1 is a side view of a hockey stick according to a first 30 embodiment of the invention;

Figure 2 is a front view of the hockey stick shown in Figure 1;

Figure 3 is a cross-sectional view as seen along line 3-3 in Figure 1;

Figure 4 is a cross-sectional view as shown in Figure 3 of another



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embodiment of the invention;

Figure 5 is a perspective view of the free end of the hockey stick shown in Figures 1, 2, and 3;

Figure 6 is a cross-sectional view as seen along line 6-6 in Figure 1;

Figure 7 is a perspective view of the free end of a hockey stick handle according to another embodiment of the invention; and

Figures 8 and 9 are transverse cross-sectional views of the handles of hockey sticks according to different embodiments of the invention.

10 The hockey stick illustrated in Figures 1 and 2 include a blade portion 1, of any conventional shape and material, such as the curved wooden blade now used by the hockey players. The blade is preferably reinforced with covering of glass fibre and plastics, as in conventional construction. The hockey stick also includes a handle portion 2 having a core 3 of wood material and a pair of reinforcement layers or strips 4 secured against the opposite lateral sides respectively of the core 3.

In the embodiment of Figures 1, 2, 3, 5, and 6, the reinforcement strips 4 are formed of a fabric woven with glass fibre filaments 5 extending lengthwise of the handle portion and embedded into a layer of plastics. A band 6, of plastics or elastic material and of a suitable color, surrounds the handle portion over the joint between the lower end of the reinforcement strips 4 and the conventional glass fibre and plastic covering of the blade portion 1. Band 6 serves to hide said joint and to decorate the hockey stick.

As shown in Figure 4, the reinforcement strips 4 on the opposite sides of core 3 are formed of a single strip 7 bent tightly around the free end of the handle portion and temporarily retained in tension at its opposite ends by small nails, tacks 8, staples or the like. The strip 7 is glued against the core 3 for adhesion thereto. The strip 7 includes glass fibres which extend lengthwise of the handle portion or core 3 and woven into a fabric. After strip 7 firmly adheres to core 3, tacks 8 are removed and the outer end of the handle portion is finished, as shown in Figure 5, wherein the folded portion of strip 7 has been

removed and the edges of the handle have been bevelled.

According to another embodiment of the invention, as shown in Figures 7 and 8, the handle portion may include a core 9 having grooves 10 extending lengthwise and into the opposite lateral sides thereof. A number of glass fibres or glass filaments 11 are bunched into each groove 10 and run lengthwise thereof embedded into a plastic which is adhered to the core 9.

In the embodiment illustrated in Figure 9, a series of glass filaments 11 extend side by side and are embedded into a plastic forming flat strips adhered against the opposite lateral sides of the handle portion.

It must be noted that the glass fibre filaments 5 and 11 may be prestressed and retained in that condition within the plastics in which they are embedded.

The filaments of glass fibres may also be embodied into a sleeve fitting tightly over the free end of the core 8 or 9 defining the handle portion.

Due to the stiffness imparted by the reinforcement layers or strips, the core of the handle portion may be made of wood material selected from lower grade hard woods instead of the best hard woods as is now the practice. Furthermore, laminated wood or plywood may be used as well as a solid core.

From the results of tests carried out with sticks of different constructions, a hockey stick according to the present invention achieves a still better resistance to breakage than a conventional oversize stick made of a best grade of wood. The oversize hockey sticks may therefore be advantageously replaced by hockey sticks according to the present invention.

It has been discovered, for instance, that the ramin wood is particularly suitable to make the core of the handle portion of a hockey stick, according to the lightness, rigidity and undistorting properties of that wood imported from the East.

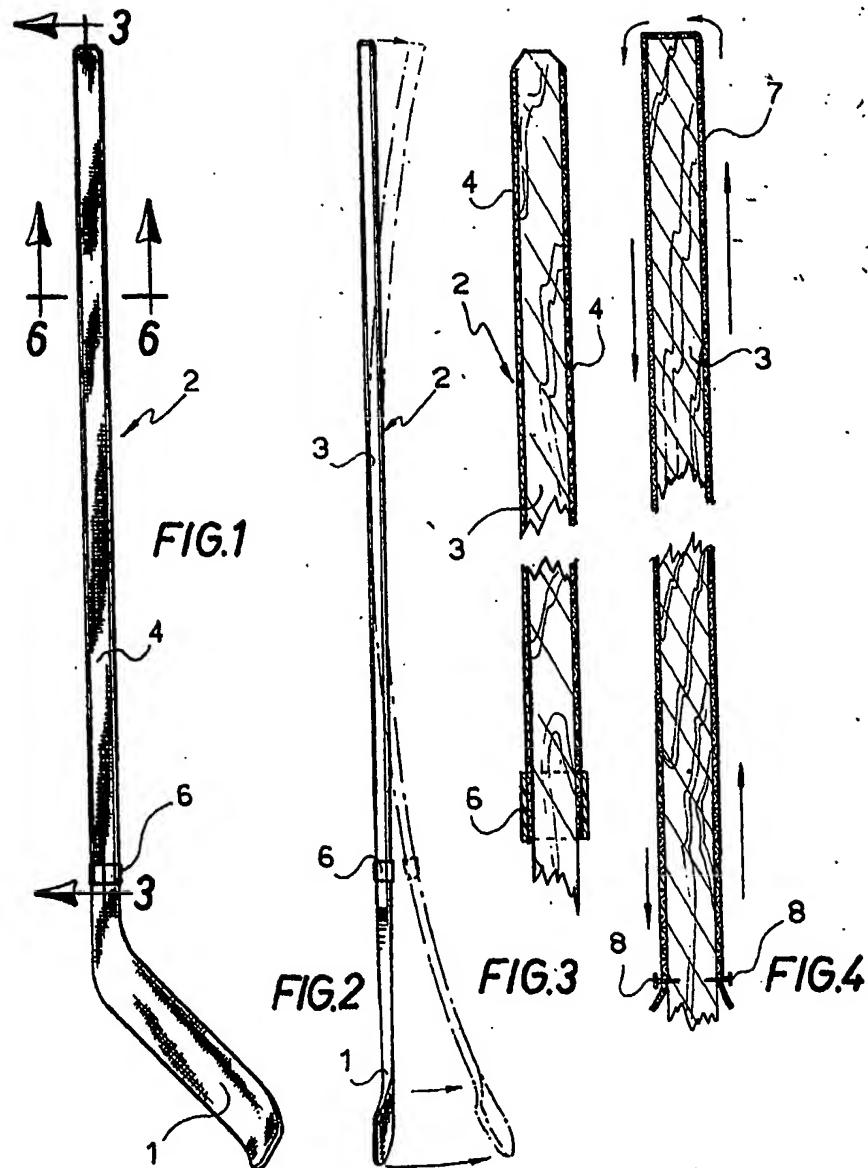
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A series of tests have been carried out with glass fibre reinforced hockey sticks having a core of ramin wood and the results indicate a sharp improvement in the resistance to breakage as compared to hockey sticks having no glass fibre reinforcement.

In accordance with the invention, types of stress resisting filaments could be used other than glass fibres. For instance, filaments of carbon fibres alone or mixed with glass fibres could be used to advantage due to the very high tensile strength and stiffness modulus of graphite fibres.

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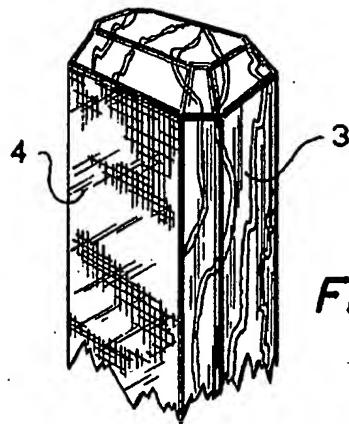


FIG.5

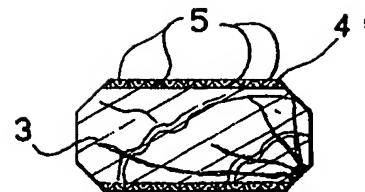


FIG.6

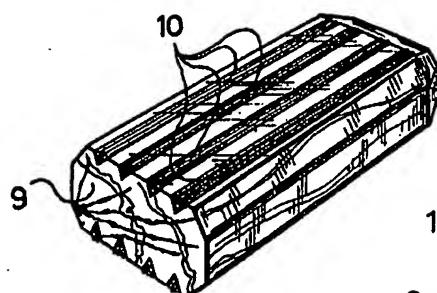


FIG.7

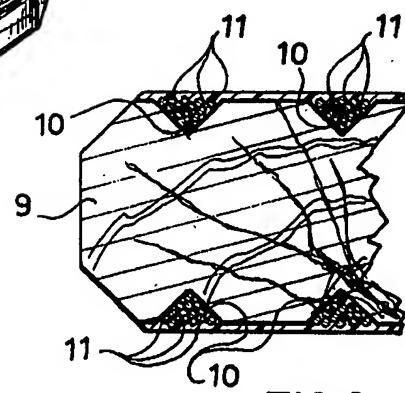


FIG.8

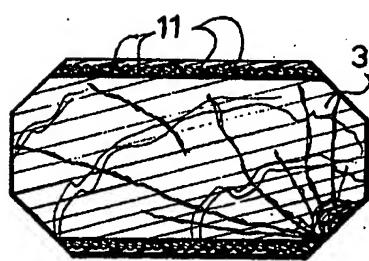


FIG.9

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